

WHAT IS CLAIMED IS:

1. A service distribution device for distributing services among a plurality of servers on a network to balance the server loads, comprising:
 - 5 a packet capture device capturing packets transmitted through the network;
 - a server identifier recording information pertaining to the captured packets into a server log for each server;
 - a service identifier recording information pertaining to the captured packets into a service log for each service;
 - 10 a server modeling module setting up the simulation model for each server from the server records;
 - a service modeling module setting up the simulation model for each service from the service records;
 - 15 a simulator reading in the server model and the service model and running each simulation; and
 - a server selection module selecting and specifying an optimum server to distribute services to based on a simulator result.

2. The service distribution device of claim 1, further comprising a packet relay device obtaining packets using a packet capture module mounted on said packet relay device, which relays packets between a client and the servers.

3. The service distribution device of claim 1,

wherein said server modeling module constructs a server model having a queue corresponding to a transmission process using the server log and a server transmission throughput, a server processing time, and a unit processing time as parameters,

5 wherein the server transmission throughput is calculated from a total size L of an arbitrary, continuous string of the continuously transmitted packets using the formula $L / (t_e - t_s)$ where t_e is an ending packet capture time and t_s is a starting packet capture time, and

wherein the server processing time is calculated using the formula $(t_s - t_c) - (l_s + l_c) / B$, wherein t_s and l_s are the capture time and size of a server response packet, respectively, t_c and l_c are the capture time and size of a corresponding client response packet, respectively, and B is a network speed.

4. The server distribution device of claim 1, wherein said service modeling module

15 calculates the following parameters from the service log by constructing a service model for each service:

a ratio of the number of sessions for each service to the number of sessions for all services,

20 a session starting frequency or time interval,

a number of transmissions between the client and server per session,

a client response size, packet size, and packet count per transmission,

a server response size, packet size, and packet count per transmission, and

a time from the server response until the client response.

5. The service distribution device of claim 1, wherein said simulator performs a simulation using the server model and the service model and generates a mean value or a median value of a session time for the specific service.

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6. The service distribution device of claim 1, wherein said server selection module determines a standard value using an output of a single simulation run for each service by said simulator, and determines that a high load state exists if a difference between, or the ratio of, the standard value and the output of the simulation of a plurality of sessions exceeds a pre-determined threshold.

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7. The service distribution device of claim 6, wherein when said server selection module receives a server distribution query, said server selection module sets a server permission to be a starting frequency of the session that will cause a high load state for the service in question for each server, and specifies a server having the biggest difference between the session starting frequency and the permission as a server for distribution.

8. The service distribution device of claim 6, wherein when said server selection module receives a distribution server query, said server selection module runs a simulation for 20 a service in question for each server and specifies a server for which a result of a ratio for which β multiplied by the standard value is less than or equal to γ .

9. The service distribution device of claim 6, wherein when said server selection module receives a distribution server query, said server selection module runs a simulation for a service in question for each server and specifies as a distribution server, a server for which a result of ratio for which β multiplied by the standard value is smallest.

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10. The service distribution device of claim 4, wherein said service modeling module categories each session transmission as a connection request and response, and a command transmission, a data transmission, a response, and an end, and calculates the parameters for each session transmission based upon category.

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11. The service distribution device of claim 7, wherein the permissions of each of the servers are taken as weighted values of a service distribution or relative ratios of the permissions are taken as server distribution ratios.

12. A service distribution device for distributing services among a plurality of servers to balance server loads, comprising:

a server modeling module generating a simulation model for each server and a service modeling module generating a simulation model for each service;

20 a simulator reading the server models and the service models and running a plurality of simulations; and

a server selection module determining which servers have low loads based on results of the simulations and selecting the servers with low loads to receive the services.

loads, comprising:

generating a simulation model for each server and each service;

running a plurality of simulations using the server and service models; and

determining which servers have low loads based on results of the simulations

and selecting the servers with low loads to receive the services.

process of:

process of:

generating a simulation model for each server and each service;

running a plurality of simulations using the server and service models; and

determining which servers have low loads based on results of the simulations

and selecting the servers with low loads to receive the services.

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